Regulatory Basis and Rationale for 316(a) Thermal Variances

Section 316(a) of the Clean Water Act, 33 U.S.C. § 1326(a)[1], provides that the EPA and delegated state agencies may authorize alternate thermal conditions in NPDES permits where the effluent limitation is more stringent than necessary to assure the protection and propagation of a balanced, indigenous community of shellfish, fish, and wildlife in and on the body of water into which the thermal discharge is made. State regulations, in turn, provide for the granting of thermal variances and have the requisite authority to issue such variances. The variances are reviewed with each NPDES permit renewal.

The party seeking the thermal variance has the burden of making the necessary demonstration that a variance is justified. In order for the permitting agency to determine whether a variance is warranted, the permit applicant typically must conduct scientific investigations to demonstrate, either through predictive or empirical means, that a balanced, indigenous aquatic community will be, or is currently, maintained and protected.

The regulatory provisions that implement CWA § 316(a) provide limited guidance on precisely what the demonstration must contain to be considered adequate and do not identify precise criteria against which to measure whether a "balanced and indigenous" aquatic community is protected and maintained. Instead, the regulations provide broad guidelines.

Under the broad regulatory guidelines, the discharger must show that the alternate effluent limitation desired, "considering the cumulative impact of its thermal discharge together with all other significant impacts on the species affected," will "assure the protection and propagation of a balanced, indigenous community of shellfish, fish and wildlife in and on the body of water into which the discharge is to be made (40 CFR § 125.73). Critical to the demonstration is the meaning of the term "balanced indigenous community". The rules provide the following definition:

---

[1] With respect to any point source otherwise subject to the provisions of section 1311 of this title or section 1316 of this title, whenever the owner or operator of any such source, after opportunity for public hearing, can demonstrate to the satisfaction of the Administrator (or, if appropriate, the State) that any effluent limitation proposed for the control of the thermal component of any discharge from such source will require effluent limitations more stringent than necessary to assure the projection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water into which the discharge is to be made, the Administrator (or, if appropriate, the State) may impose an effluent limitation under such sections for such plant, with respect to the thermal component of such discharge (taking into account the interaction of such thermal component with other pollutants), that will assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on that body of water.

> *The term "balanced indigenous community" is synonymous with the term balanced, indigenous population in the Act and means a biotic community typically characterized by diversity, the capacity to sustain itself through cyclic seasonal changes, presence of necessary food chain species and by a lack of domination by pollution tolerant species. Such a community may include historically non-native species introduced in connection with a program of wildlife management and species whose presence or abundance results from substantial, irreversible environmental modifications* (40 CFR § 125.71).

According to EPA (1977), a balanced indigenous community (BIC) "consists of desirable species of fish, shellfish, and wildlife, including the biota at other trophic levels which are necessary as a part of the food chain or otherwise ecologically important to the maintenance of the community" and the BIC "should be consistent with the restoration and maintenance of the biological integrity of the water".

During the drafting of its 316(a) guidance, EPA (1977) recognized the difficulty of evaluating the entire community and all the members of it and thus established Representative Important Species (RIS). The assumption is that if the RIS are doing well, then the entire community should also be doing well. Thus, a 316(a) demonstration can focus primarily or even entirely on RIS. If this approach is taken, then it is important to assess populations of each RIS and determine how existing or proposed thermal limits will (have) affected each one.

There are several methodologies a discharger may pursue in making a 316(a) demonstration. Under the regulations, new dischargers must use predictive methods (e.g., laboratory studies, literature surveys, or modeling) to estimate an appropriate alternate thermal limit that will assure the protection and propagation of a balanced, indigenous community prior to commencing the thermal discharge. However, existing dischargers need not use predictive methods. For such dischargers, 316(a) demonstrations may be based upon the "absence of prior appreciable harm" to a balanced, indigenous community. Such demonstrations must show <u>either</u> that:

i) *No appreciable harm has resulted from the thermal component of the discharge taking into account the interaction of such thermal component with other pollutants and the additive effect of other thermal sources to a balanced, indigenous community of shellfish, fish, and wildlife in and on the body of water into which the discharge has been made; or*

ii) *Despite the occurrence of such previous harm, the desired alternative effluent limitations (or appropriate modifications thereof) will nevertheless assure the protection and propagation of a balanced, indigenous community of shellfish, fish, and wildlife in and on the body of water into which the discharge is made* [40 CFR § 125.73(c)(1)(i) and (ii)].

Furthermore, in determining whether or not prior appreciable harm has occurred, the regulations provide that the permitting agency must consider the length of time during which the applicant has been discharging and the nature of the discharge. The regulations do not define "prior appreciable harm." However, using the definition of "balanced, indigenous community," a variance is granted under either of the following circumstances:

1. When a discharger shows that the characteristics of a balanced indigenous community (i.e., diversity, the capacity to sustain itself through cyclic seasonal changes, presence of necessary food chain species, and a lack of domination by pollution tolerant species) exist. Stated another way, the existence of such characteristics prove that the aquatic community has not been appreciably harmed; or

2. Despite any evidence of previous harm, the characteristics of a balanced indigenous community, as stated above, will nevertheless be protected and assured under the alternate limit.

Appreciable harm has not been rigidly defined.

It is also important to understand that a successful 316(a) demonstration does **not** require that prior appreciable harm be absent, but only that if such harm is noted that the existing or proposed variance does not prevent the protection or establishment of the balanced indigenous community (i.e., it is not the existing or proposed thermal standards that limit the aquatic community).

The 316(a) demonstration is found to be successful if the data justify the conclusions of the biological rationales, which support the 316(a) test of protection and propagation of the balanced indigenous population. EPA (1977) lists the following rationales:

- There is no convincing evidence that there will be damage to the balanced, indigenous community, or community components, resulting in such phenomenon as those identified in the definition of appreciable harm.

- Receiving water temperatures outside any (State established) mixing zone will not be in excess of the upper temperature limits for survival, growth, and reproduction, as applicable, of any RIS occurring in the receiving water.

- The receiving waters are not of such quality that in the absence of the proposed thermal discharge excessive growth of nuisance organisms would take place.

- A zone of passage will not be impaired to the extent that it will not provide for the normal movement of populations of RIS, dominant species of fish, and economically (commercial or recreational) species of fish, shellfish, and wildlife.

- There will be no adverse impact on threatened or endangered species.

- There will be no destruction of unique or rare habitat without a detailed and convincing justification of why the destruction should not constitute a basis for denial.

- The applicant's rationales present convincing summaries explaining why the planned use of biocides such as chlorine will not result in appreciable harm to the balanced indigenous population.

The representative important species data must also support the conclusions of the study and meet the related decision criteria. Technical experts, US Fish and Wildlife staff, and other experts are to be consulted. If the, "summary rational for the study is convincing, is supported sufficiently by all sections of the demonstration, and is not convincingly negated by outside evidence, the applicant's 316(a) demonstration is successful (EPA 1977)."

References

EPA. 1977. Interagency 316(a) technical guidance manual and guide for thermal effects sections of nuclear facilities environmental impact statements. US EPA, Washington, D.C.